NEW TREE SPECIES FROM ESMERALDAS, ECUADOR (CONTINUED)

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Four new tree species from the Province of Esmeraldas in northwestern Ecuador are published here in the following genera (and families): Wettinia Poepp. ex Endl. (Palmae), Virola Aubl. (Myristicaceae), 2, and Clusia L. (Guttiferae). Also, a new combination is made in Inga Mill. (Leguminosae).

This article is a continuation of articles with the same title (Phytologia 18: 195-208, 404-418, 457-472, illus. 1969), the fourth in a series. Each description is accompanied by a line drawing prepared for a book on the common trees of Esmeraldas, now in press. The work was done under the forestry project, Desarrollo Forestal de Noroccidente (DEFORNO). This was United Nations Special Fund Project No. 127, administered by the Food and Agriculture Organization (FAO) of the United Nations and the Government of Ecuador.

WETTINIA UTILIS Little, sp. nov. "Gualte." Fig. 17.

Arbor vel palma parva sempervirens ad 10-15 m. alta, trunco gracili 10-20 cm. diametro, griseo, laevi, annulato. Radices sustinentes multae 0.5-1 m. altae, 3-5 cm. diametro, brunneae spinis multis brevibus. Folia vel frondes minimum 6, alterna patentia pinnata, 3-5 m. longa. Petiolus brevis vagina tubulari minimum 1 m. longa, albido-virens. Rhachis crassa, 3-5 m. longa, brunnea, puberula, supra carinata, subtus complanata. Foliola vel segmenta multa, subopposita, cernua, linearia, fere 1 m. longa et 10 cm. lata, coriacea, basi angustata et plicata, apice acuminata, margine parum sinuata, supra impolito-viridia nervis 10-15 parallelis impressis, subtus impolito-virescentia subtiliter bruneo-puberula nervis prominentibus.

Inflorescentia infrafoliares plures unisexuales erectae, spathis fusiformibus 20-34 cm. longis, 6-9 cm. latis, apice acutis, virescentibus vel griseis, puberulis, lignosis, sutura 1. Inflorescentiae masculae spathis lignosis 3, spadice ramulis 4 longis. Flores masculis aggregati sessiles 1 cm. longi, albi, sepalis 3 linearibus 2 mm. longis, 3-4 petalis lanceolatis 5-7 mm. longis, 8-11 staminibus 7-8 mm. longis filamentibus brevibus 1 mm. longis. Inflorescentiae femineae spadice ramulis 3 vel 4. Flores feminei 1 cm. longi, 3 sepalis, 3 petalis et pistillo stylo basale stigmatibus 3 longis.

Spadix fructifer cernuus, pedunculo crasso complanato 20 cm. longo fructibus aggregatis cylindricis 3 vel 4, 20-30 cm. longis, 8 cm. diametro. Fructi multi arctissime conferti, obovoidei vel obpyramidales, 2.5-3 cm. longi, 1.5-2 cm. lati, ob pressione 4-6-angulati, apice convexi, puberuli, sepalis, petalis styloque persistentibus. Semen ellipsoideum 1.5-2 cm. longum.

Small evergreen tree or palm 10-15 m. high, with slender trunk 10-20 cm. in diameter, gray, smooth, with rings. Prop roots many, 0.5-1 m. high and 3-5 cm. in diameter, brown, with many short spines. Bud very narrow, linear, formed by a young folded leaf. Leaves or fronds 6 or more, alternate, spreading, pinnate, 3-5 m. long. Petiole short with tubular sheath 1 m. long or more, whitish green. Rachis stout, 3-5 m. long, brown, puberulent, keeled above, flattened beneath. Leaflets or segments many, almost opposite, drooping, linear, nearly 1 m. long and 10 cm. wide, coriaceous, narrowed and folded at base, acuminate at apex, slightly wavy at margin, above dull green with 10-15 parallel impressed nerves, and beneath dull light green, finely brown-hairy, with prominent nerves.

Inflorescences below the leaves, several, unisexual, erect, with fusiform spathes 20-34 cm. long and 6-9 cm. wide, acute at apex, whitish green or gray, puberulent, woody, splitting open on 1 side. Male inflorescences with 3 woody spathes, spadix with 4 long branches. Male flowers many, crowded, sessile, 1 cm. long, white, composed of 3 linear sepals 2 mm. long, 3-4 lanceolate petals 5-7 mm. long, 8-11 stamens 7-8 mm. long with short filaments 1 mm. long. Female inflorescences with spadix with 3 or 4 branches. Female flowers 1 cm. long, composed of 3 sepals, 3 petals, and pistil with basal style and 3 long stigmas.

Fruiting spadix drooping, with stout flattened peduncle 20 cm. long and 3 or 4 cylindrical aggregate fruits 20-30 cm. long and 8 cm. in diameter. Fruits many, very crowded, obovoid or obpyramid-shaped, 2.5-3 cm. long, 1.5-2 cm. wide, 4-6-angled from pressure, convex at apex, puberulent, with sepals, petals, and style persistent. Seed ellipsoid, 1.5-2 cm. long. Collected with flowers and fruits in September.

Trunk in cross section with hard outer layer 3 cm. thick and large black vascular bundles scattered in orange-streaked soft pith.

Gualte is important for a special use of it slender smooth trunks, which are strong and durable. They make excellent telegraph poles and were used for that purpose along the narrow-gage railroad connecting San Lorenzo on the Pacific Coast with the Sierra. Elsewhere they should serve similar uses for poles.

ECUADOR, ESMERALDAS: Alto Tambo, alt. 650 m., lower montane forest, Sept. 22, 1965, E. L. Little, Jr., and R. G. Dixon 21114 (HOLOTYPE, US; isotype, BH).

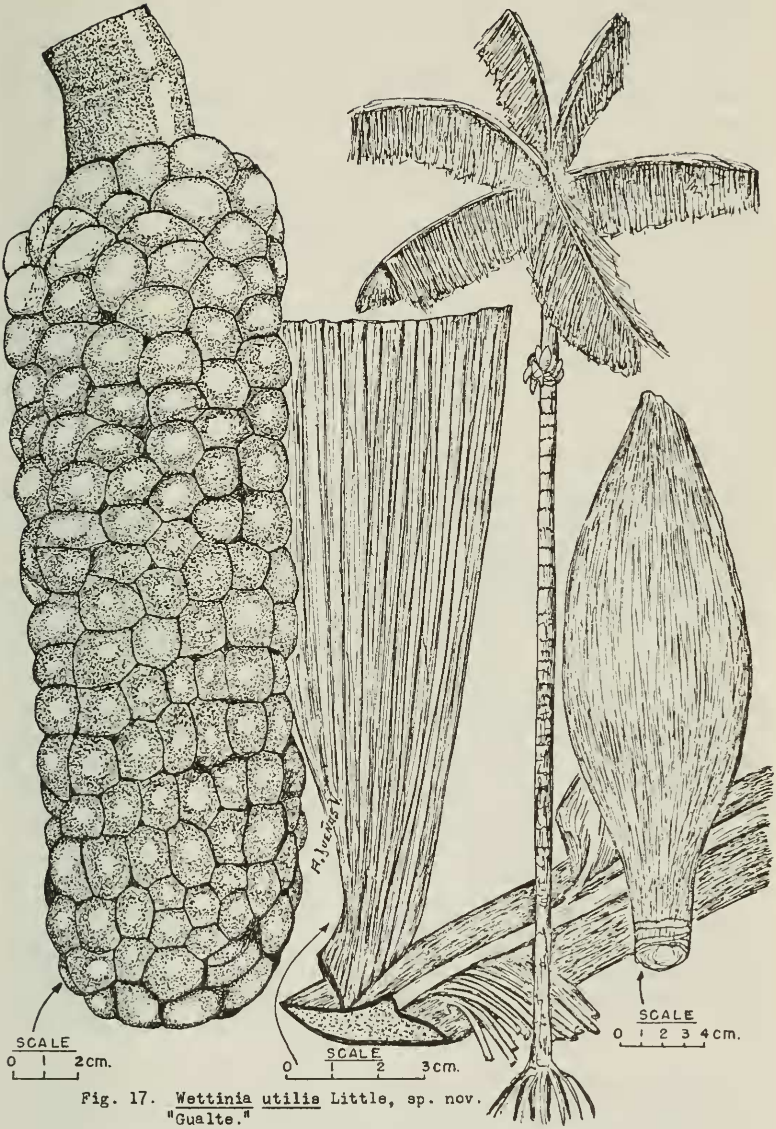
A. Jueñas V.
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Fig. 17. Wettinia utilis Little, sp. nov.
"Gualte."

This palm is common in the lower montane forest of Esmeraldas. The type was collected at Alto Tambo, a small station along the railroad and the location of a forest survey line. Gualte was observed also near Quinindé.

Fig. 17 illustrates a mature palm, also, from left to right a branch or an aggregate fruit of the fruiting spadix, a portion of the rachis with base of segments, and a spathe.

The palm genus Wettinia Poepp. ex Endl. contains 6 species, including this one. There are 3 in Peru (J. Francis Macbride, Fl. Peru 1: 360-362. 1960). Of those, W. maynensis Spruce is recorded also from eastern Ecuador. Two others are in Colombia (Armando Dugand, Caldasia 1: 37. 1940).

Wettinia utilis is related to W. quinaria (Cook & Doyle) Burret, of the Pacific slope of western Colombia. O. F. Cook and C. B. Doyle (Contrib. U. S. Natl. Herbarium 16: 235-237. 1913) recorded the common name "gualte" for that species. Incidentally, the original publication (as Wettinella quinaria Cook & Doyle) contained an error in the photographs only partly corrected afterwards. The 2 photographs in fig. 54, each of a palm leaf and fruits, have the leaves reversed. Fig. 54B labeled Wettinella quinaria shows the characteristic fruit stalk bearing 4 large masses of fruits. However, the accompanying leaf belongs to fig. 54A, labeled Acrostigma equale Cook & Doyle, and the leaf under the latter name should be with fig. 54B. Wettinia quinaria has large aggregate fruits to 39 cm. long and with long hairs.

One of the conspicuous plant families of trees in the wet tropical forests of Esmeraldas after Lauraceae and Moraceae, is Myristicaceae. The trees are common, and the light-weight soft woods are commercially important. A new species was described in a previous article, Osteophloem sulcatum Little (Phytologia 18: 404, fig. 6. 1969), "chalviande (frutos surcados)" or "chalviande colorado." Dialyanthera, common name "cuángare," is represented by D. gordoniifolia (Warb.) A. DC., D. gracilipes A. C. Smith, and a third species, "cuánguare blanco."

The tropical American genus Virola Aubl. contains about 50 species ranging from Guatemala and the Lesser Antilles south to southern Brazil, Bolivia, and Peru. The species are most numerous in the Amazon basin. Thirty-eight species were accepted in the monograph by A. C. Smith (The American species of Myristicaceae. Brittonia 2: 393-510, illus. 1937).

Virola, common name "chalviande," has at least 4 species in Esmeraldas. Besides V. sebifera Aubl., which is widespread in tropical America, 2 new species are described here. A sterile specimen of another species was collected also.

With the U. S. Forest Service forest survey in 1943, I collected specimens of these 2 new species of Virola, cited by genus in the report (Caribbean Forester 9: 234-235. 1948). The specimens were annotated by A. C. Smith as probably new but too poor for description. Additional material was collected in 1965. In the interval both were found also in southwestern Colombia.

In 1943, Santo Domingo de los Colorados, Province of Pichincha, was an outpost at the end of the road west of Quito and surrounded by wet tropical forest. Returning in 1965, I found a growing city. The trail northwest in the Province of Esmeraldas to Quinindé, earlier 4 days by pack trip, had become a paved highway. The forests had been replaced by banana plantations. Near Santo Domingo de los Colorados one small patch of forest was located, but it was being cleared. Represented among the fallen trees were the 2 species of Virola and the new species of Clusia described below.

VIROLA DIXONII Little, sp. nov. "Chalviande (peludo)," "chalviande." Fig. 18.

Arbor magna sempervirens ad 35 m. alta, trunco 50-75 cm. diametro, anteridibus altis angustis ad 2 m. altis latisque. Cortex asper, subtiliter fissuratus, griseus; cortex interior roseus demum aurantiacus ubi expositus, condimenti sapore amaro, succo rubello amaro. Ramuli fere horizontales non ramosi, longi, pubescentes, flavo-virides. Ramuli, petioli, foliorum paginae infernae, atque flores dense stellato-pilosi pilis cinnamomei vel ferruginei. Gemmae nudae folii juvenis plicati ferrugineo-pilosi formatae. Folia alterna biserialia, petiolis crassis curvis 0.5-1 cm. longis, longitudinaliter sulcatis, virescentibus vel brunneis. Laminae anguste oblongae, 13-25 cm. longae, 3.5-6 cm. latae, parum coriaceae, apice acuminatae, basi acutae, margine plus minusve revolutae, nervis lateralibus 25-40 utrinque rectis parallelis impressis sub angulo fere 90° abeuntibus, supra atrovirentes nitidae glabratae, subtus flavo-virides puberulae nervis prominentibus.

Dioecia. Paniculae axillares 3-6 cm. longae, multis floribus puberulis 2-3 mm. longis latisque, pedicellis tenuibus puberulis 1-2 mm. longis extensis. Flores masculini plures fasciculati ramulis crassis puberulis, calyce plus quam dimidio ad basin trilobato, androecio filamentibus tenuibus 1 mm. longis et antheris connatis 0.5 mm. longis composito. Flores feminei calyce plus quam dimidio ad basin trilobato, ovario globoso puberulo 2 mm. longo, stigmate bilobo.

Fructi drupae dehiscentes 1-5 pedunculo crasso 2-4 cm. longo, ellipsoideae vel subglobosae 4 cm. longae, 3-3.5 cm. diametro (in vivo), griseo-virides demum brunneas, pericarpio crasso, bivalves, aromaticae. Semen ellipsoideum 3 cm. longum, 2.3 cm. diametro, arillo laciniato rubro ad dimidium obtectum.

Large evergreen tree to 35 m. high, with trunk 50-75 cm. in diameter, with high narrow buttresses to 2 m. high and wide. Bark rough, finely fissured, gray; inner bark pink, turning orange when exposed, with bitter taste of spice, and with bitter reddish sap. Twigs nearly horizontal, unbranched, long, hairy, yellow green. Twigs, petioles, lower surface of leaves, and flowers densely stellate-pilose with cinnamon or rust-colored hairs. Buds naked, formed from a folded rusty hairy young leaf. Leaves alternate in 2 rows, with stout curved petioles 0.5-1 cm. long, longitudinally grooved, light green or brown. Blades narrowly oblong, 13-25 cm. long, 3.5-6 cm. wide, slightly coriaceous, acuminate at apex, acute at base, slightly revolute at margin, with 25-40 straight parallel impressed lateral nerves on each side at angle almost 90°, above shiny dark green and glabrate, beneath yellow green, puberulent with prominent nerves.

Dioecious. Panicles axillary, 3-6 cm. long, with many puberulent flowers 2-3 mm. long and broad, on slender puberulent pedicels 1-2 mm. long. Staminate flowers several fasciculate on stout puberulent branches, with calyx 3-lobed more than half to base and androecium of slender filament 1 mm. long and connate anthers 0.5 mm. long. Pistillate flowers puberulent with orange-colored calyx 3-lobed more than half to base, rounded puberulent ovary 2 mm. long and 2-lobed stigma.

Fruits dehiscent drupes 1-5 on stout peduncle 2-4 cm. long, ellipsoid or subglobose, 4 cm. long, 3-3.5 cm. in diameter (fresh), gray green, afterwards brown, thick-walled, 2-valved, aromatic. Seed ellipsoid, 3 cm. long, 2.3 cm. in diameter, half covered by laciniate red aril. Perhaps flowering and fruiting irregularly through the year.

The sapwood is whitish or cream-colored, and the heartwood pink. The soft, light-weight wood is used for general light construction and plywood.

ECUADOR, ESMERALDAS: San Lorenzo, alt. 30 ft., wet tropical forest, Apr. 20, 1943. E. L. Little, Jr. 6300 (immature fruit; US); same locality, Apr. 21, 1943, E. L. Little, Jr. 6315 (US); Borbón, alt. 10 m., wet forest, Sept. 10, 1965, E. L. Little, Jr. and R. G. Dixon 21032 (fruit; US, NY; wood sample, MADw); San Antonio, 20 km. S. of Borbón on Río Cayapas, alt. 60 m., wet forest, Sept. 18, 1965, E. L. Little, Jr., and R. G. Dixon 21088 (♀, fruit; US, NY) and 21092 (♂; HOLOTYPE, US; isotype, NY); Estero Capulí, Río Pambil, alt. 20 m., July 4, 1966, C. Játiva 295 (1063; ♀; US, LA).

COLOMBIA, NARIÑO: Costa del Pacífico, Río Chagüí, Quebrada Alojal, Mar. 15, 1955, "chalviande," F. B. Lamb 190 (♀, US).

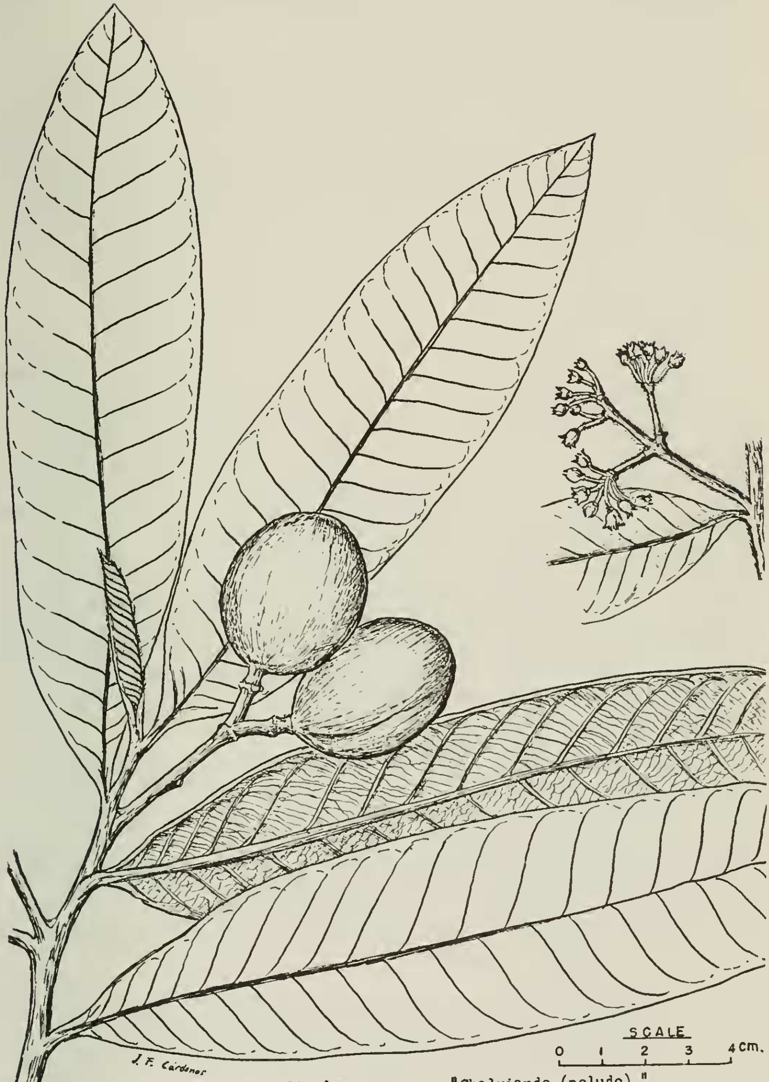

Fig. 18. *Virola dixonii* Little, sp. nov. "Chalviande (peludo)."

This species is known from the Pacific Coast of northwestern Ecuador, also Narino in southwestern Colombia. It is very common in the wet tropical forest at low altitudes in Esmeraldas. Also, as noted above, it was observed south to Santo Domingo de los Colorados, Province of Pichincha.

Fig. 18 illustrates a portion of a fruiting twig, also at right a pistillate inflorescence (*E. L. Little, Jr., and R. G. Dixon 21088*).

Robert G. Dixon, Australian silviculturist with the forestry assisted in collecting the type and other specimens, also a wood sample for testing.

VIROLA REIDII Little, sp. nov. "Chalviande (lampiño)," "chalviande." Fig. 19.

Arbor magna sempervirens ad 40 m. alta, trunco 60 cm. diametro, anteridibus altis angustis ad 2 m. altis. Cortex subtiliter fissuratus vel fere laevis, interdum lenticellis verrucosis, griseo-roseus vel brunneus; cortex interior roseo et rubello-vittatus, insipidus, succo rubello amaro. Ramuli fere horizontales facie glabrata vero minute stellato-pilosi, virescentibus. Gemmae nudae folii juvenis plicati pubescentis compositae, cinnamomeae vel flavo-virides. Folia alterna biserialia, petiolis crassis 0.5-1 cm. longis, longitudinaliter sulcatis, virescentibus. Laminae anguste oblongae vel oblanceolatae, 10-23 cm. longae, 3-6.5 cm. latae, papyraceae vel parum coriaceae, glabratae, apice acutae, basi acutae vel rotundatae, margine revolutae, nervis lateralibus 25-35 vel pluribus rectis parallelis utrinque sub angulo fere 90° abeuntibus, supra atrovirentes plus minusve nitidae vel opacae, subtus albidovirentes nervis flavidis prominentibus.

Dioecia. Paniculae axillares 3-7 cm. longae, multis floribus puberulis ramulis crassis puberulis. Flores masculini plures fasciculati pedicellis tenuibus puberulis 2 mm. longis, 2 mm. longi, calyce flavido plusquam dimidio ad basin trilobata, androecio filamentibus tenuibus 0.5-1 mm. longis et antherarum connatis 9.5 mm. longis composita. Flores feminei pauci pedicellis tenuibus puberulis 3 mm. longis, 2-3 mm. longis, calyce brunneo plus quam dimidio ad basin trilobato, ovario globoso puberulo 1 mm. longo stigmate bilobo.

Fructi drupae dehiscentes 1-2 pedunculo crasso 3-4 cm. longo, ellipsoideae 3 mm. longae, 2.5 cm. diametro (in vivo), viridea demum atro-brunneae, pericarpio crasso, bivalves, aromaticae. Semen ellipsoideum 22-25 mm. longum, 14-17 mm. diametro, arillo laciniato rubro fere obtectum.

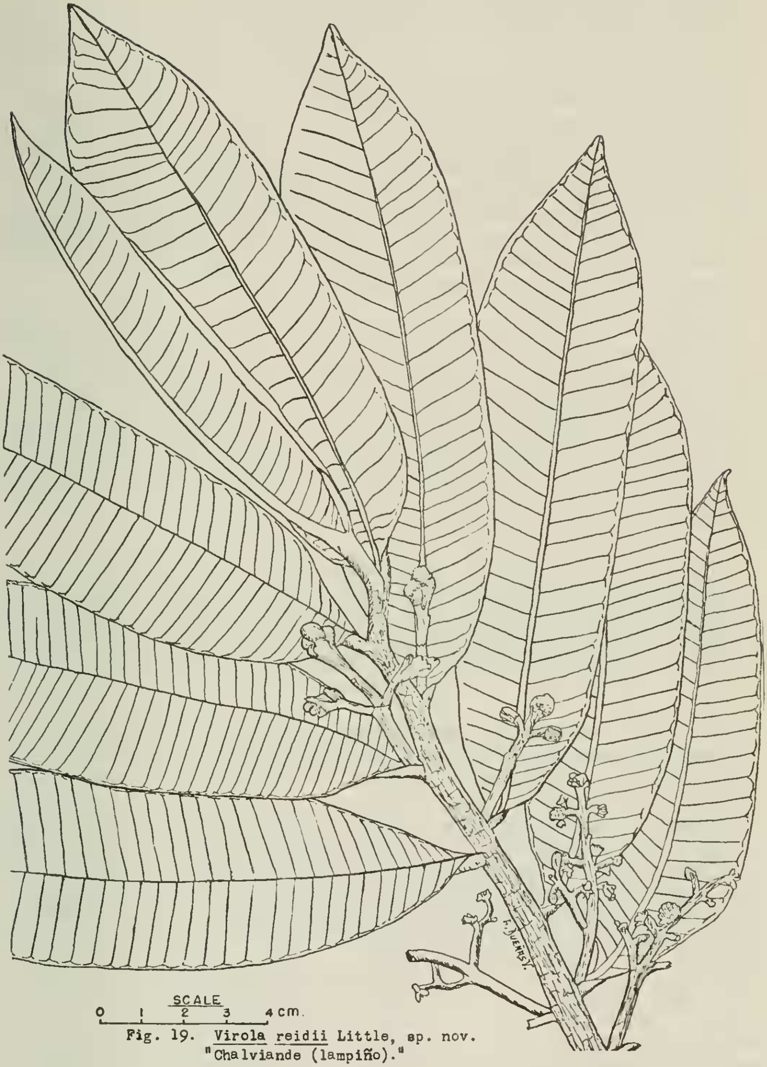

Fig. 19. Virola reidii Little, sp. nov.
"Chalviande (lampiño)."

Large evergreen tree to 40 m. high and 60 cm. in trunk diameter, with high narrow buttresses to 2 m. high. Bark finely fissured or nearly smooth, sometimes with warty lenticels, pink gray or brown; inner bark pink and reddish streaked, tasteless, with bitter reddish sap. Twigs nearly horizontal, long, appearing glabrate but with minute stellate hairs, light green. Buds naked, formed from a folded hairy young leaf, cinnamon-colored or yellow green. Leaves alternate in 2 rows, with stout petioles 0.5-1 cm. long, longitudinally grooved, light green. Blades narrowly oblong or oblanceolate, 10-23 cm. long, 3-6.5 cm. wide, papyraceous or slightly coriaceous, glabrate, acute at apex, acute or rounded at base, revolute at margin, with 25-35 or more straight parallel lateral nerves on each side departing at angle almost 90°, above dark green and slightly shiny or dull, beneath whitish green with prominent yellowish nerves.

Dioecious. Panicles axillary, 3-7 cm. long, with many puberulent flowers on stout puberulent branches. Staminate flowers several fasciculate, on slender puberulent pedicels 2 mm. long, 2 mm. long, with yellowish calyx 3-lobed more than half to base, androecium of slender filament 0.5-1 mm. long and connate anthers 0.5 mm. long. Pistillate flowers few on slender puberulent pedicels 3 mm. long, 2-3 mm. long, with brown calyx 3-lobed more than half to base, rounded puberulent ovary 1 mm. long and 2-lobed stigma.

Fruits dehiscent drupes 1 or 2 on stout peduncle 3-4 cm. long, ellipsoid, 3 cm. long, 2.5 cm. in diameter (fresh), green, afterwards dark brown, thick-walled, 2-valved, aromatic. Seed ellipsoid, 22-25 mm. long, 14-17 mm. in diameter, nearly covered by laciniate red aril. Perhaps flowering and fruiting irregularly through the year.

Wood with whitish or cream-colored sapwood and heartwood pink or not differentiated, with a little reddish sap. Used for general light construction and plywood.

ECUADOR, ESMERALDAS: Playa de Oro, alt. 200 ft., wet tropical forest, Apr. 30, 1943, E. L. Little, Jr. 6400 (US); junction of Río Hoja Blanca and Río Hualpi, 50 km. S. of Borbón, alt. 75 m., wet forest, Sept. 15, 1965, E. L. Little, Jr., and R. G. Dixon 21065 (♂; HOLOTYPE, US; isotype, NY; wood sample, MADw); San Antonio, 20 km. S. of Borbón on Río Cayapas, alt. 60 m., wet forest, Sept. 18, 1965, E. L. Little, Jr., and R. G. Dixon 21091 (US, NY); Panadero, 7 km. E. of San Lorenzo. alt. 40 m., wet forest (fruit; US, NY; wood sample, MADw), Río Guayllabamba, 10 km. E. of Quinindé, alt. 130 m., wet forest, E. L. Little, Jr., and R. G. Dixon 21237 (fruit; US, NY); Estero Bravo, Río Pambil, alt. 70 m., July 6. 1966, C. Játiva 301 (1078; fruit, US, LA).

ECUADOR, PICHINCHA: Santo Domingo de los Colorados, alt. 1800 ft., wet tropical forest, Apr. 3, 1943, "coco," E. L. Little, Jr. 6157 (US); same locality, Feb. 27, 1965, E. L. Little, Jr. 20457 (♀; US, NY); 20 km. W. of Santo Domingo de los Colorados, alt. 1000 ft., seasonal rain forest, Oct. 21, 1961, P. C. D. Cazalet and T. D. Pennington 5123 (US).

This species is common and widely distributed in the wet tropical forest of the Pacific Coast of northwestern Ecuador in Esmeraldas and south to Santo Domingo de los Colorados, Province of Pichincha. Also in southwestern Colombia. According to a note on E. L. Little, Jr. 6400 (US), that specimen is the same species as J. Cuatrecasas 16386 (A), Colombia, El Valle, Río Caluna, alt. 5-50 m.

Fig. 19, a leafy twig with immature staminate inflorescences, is from the type collection (E. L. Little, Jr., and R. G. Dixon 21065).

Virola reidii is associated with Elbert S. Reid, Canadian forester from Vancouver, British Columbia, and director of the 5-year forestry project, including forest inventory, in Esmeraldas from 1964 to 1969. Mr. Reid assisted the tree identification work in many ways. The project reports will provide the basis for tree identification, forest management, silviculture, utilization, and development of forest industries in Esmeraldas.

Both new species of Virola described here are known by the common name "chalviande." To distinguish them in the forest, a second word was added, referring to the obvious difference in hairiness of the foliage. Virola dixonii, "chalviande (peludo)," has hairy leaves and twigs, while V. reidii, "chalviande (lampiño)," has almost hairless foliage.

A. C. Smith in his comprehensive monograph of the family cited above prepared a key in English to 6 named "species groups" of Virola (Brittonia 2: 455. 1937). J. C. Th. Uphof (Myristicaceae. In A. Engler and K. Prantl, Natürl. Pflanzenfam. 2 Aufl. Band 17a II: 205-208. 1959) changed these groups to sections, crediting authorship to Smith. Neither author provided the Latin diagnoses for valid publication (ICBN, Art. 36). Virola dixonii is referred to the group Rugulosae. Though differing somewhat in pubescence, V. reidii has flowers similar to those of V. dixonii.

CLUSIA VENUSTA Little, sp. nov. "Matapalo." Figs. 20-22.

Arbor epiphytica vel scandens dioecia ad 6-10 m. alta, trunco 8 cm. diametro. Cortex griseus laevis latice flavo. Ramuli crassi teretes glabri, atrovirentes, nodis incrassatis annulatis atque internodis nunc longis nunc brevibus. Gemmae pari foliorum juvenorum 1.5 cm. longorum formatae. Folia opposita glabra, petiolis crassis 2-3 cm. longis atrovirentibus, basi latis et vaginantibus. Laminae ellipticae, magnae, 14-30 (35) cm. longae, 7-15 (18) cm. latae, coriaceae, apice acuminatae vel interdum acutae, basi subcordatae, margine leviter revolutae, nervis lateralibus 25-35 utrinque tenuis rectis parallelis, valde impressis, sub angulo fere 90° abeuntibus prope marginem conjunctis, supra impolito-atrovirentes, subtus impolito-pallido-virides nervis valde prominentibus.

Flores terminales solitarii pedunculo breve crasso 1 cm. longo, magni venusti, in alabastro subglobosi, minimum 6 cm. lati, rosei vel rubelli. Flores masculi bracteis calycinis 2 oppositis rotundatis 15-18 mm. longis latisque, acutis vel obtusis carinatis, sepalis 4 decussatis rotundatis 2.5-5 cm. longis latisque, concavis leviter succulentis, petalis c. 8 rotundatis 4-6 cm. longis et latis, concavis parum succulentis, roseis vel rubellis, atque disco centrali complanato stamineo 4-5.5 cm. diametro et 1 cm. alto antheris numerosissimis sessilibus 1-2 mm. longis exteribus congestis interioribus paucioribus majoribusque, 2-4-locularibus longitudinaliter dehiscentibus. Flores feminei bracteis calycinae 2 oppositis rotundatis 15 mm. longis, acutis carinatis, pallido-viridibus, sepalis 4 decussatis rotundatis concavis parum succulentis, petalis c. 10-11, rotundatis vel ellipticis concavis, tempore gemmatione albis, cupula staminodiali alba 6 mm. longa, 11-12 mm. diametro, ovario 17-21 lineis longitudinalibus, loculis 17-21 multiovulatis, stigmatibus 17-21 sessilibus radiantibus, linearibus, in annulo connatis.

Capsula terminalis solitaria late ovoidea 45-48 mm. longa, 42-45 mm. diametro, pallido-viridis, succulenta, lineis longitudinalibus loculisque 17-21, stigmatibus 17-21 sessilibus angustis nigricantibus 7-9 mm. longis, sepalis et petalis paucis persistentibus, pericarpio albido 5-8 mm. crasso, 9-10 cm. lata segmentis patentibus in dehiscente ad instar stellae. Semina multa oblonga 4 mm. longa, 1 mm. lata, alba in pulpa aurantiaca inclusa.

Epiphytic tree or vine, dioecious, 6-10 m. high, with trunk 8 cm. in diameter. Bark gray, smooth, with yellow latex. Twigs stout, terete, glabrous, dark green, with thickened ringed nodes and long and short internodes. Buds formed by a pair of young leaves 1.5 cm. long. Leaves opposite, glabrous, with stout dark green petioles 2-3 cm. long, broad and sheathlike at base.

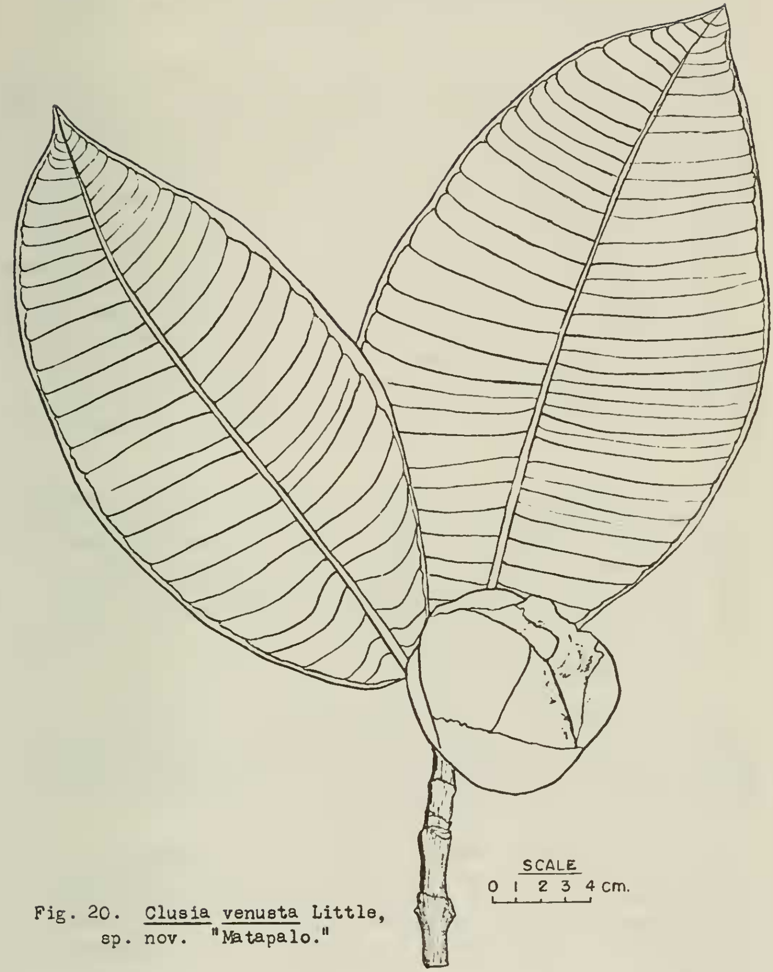

Fig. 20. Clusia venusta Little, sp. nov. "Matapalo."

Blades elliptic, large, 14-30 (35) cm. long, 7-15 (18) cm. wide, coriaceous, apex acuminate or sometimes acute, base subcordate, margin slightly revolute, with 25-35 pairs of slender straight parallel lateral nerves very impressed, departing at nearly right angle from costa and connected near margin, above dull dark green, and beneath dull light green with lateral nerves very prominent.

Flowers terminal, solitary on short stout peduncle 1 cm. long, large, beautiful, subglobose in bud, 6 cm. or more in width, pink or reddish. Male flowers with 2 opposite rounded bracts of calyx 15-18 mm. long and broad, acute or obtuse, and keeled, 4 decussate rounded sepals, concave, slightly succulent, 2.5-5 cm. long and broad, about 8 rounded petals 4-6 cm. long and broad, slightly succulent, pink or reddish, and central flattened staminal disk 4-5.5 cm. in diameter and 1 cm. high bearing very numerous sessile anthers 1-2 mm. long, outer crowded, inner fewer and larger, 2-4-celled, longitudinally dehiscing. Female flowers with 2 opposite rounded bracts of calyx 15 mm. long, acute and keeled, light green, 4 decussate rounded sepals, concave, slightly succulent, about 10-11 rounded or elliptic concave petals whitish in bud, white staminal cup 6 mm. long and 10-12 mm. in diameter, and ovary with 17-21 longitudinal lines, 17-21 cells many-ovuled, 17-21 sessile radiating linear stigmas connate in ring.

Capsule terminal, solitary, broadly ovoid, 45-48 mm. long and 43-45 mm. in diameter, light green, succulent, with 17-21 longitudinal lines and cells, with 17-21 sessile narrow blackish stigmas 7-9 mm. long, with sepals and few petals persistent, with whitish pericarp 5-8 mm. thick, in dehiscence 9-10 cm. broad with segments spreading starlike. Seeds many, oblong, 4 mm. long, 1 mm. broad, whitish, in orange pulp. Perhaps with flowers and fruits through the year.

ECUADOR, ESMERALDAS: Junction of Río Hoja Blanca and Río Hualpi, alt. 75 m., wet tropical forest, Sept. 14, 1965, E. L. Little, Jr., and R. G. Dixon 21054 (♂; US, NY); Río Pambil near junction with Estero Capulí, alt. 150 m., July 3, 1966, Carlos Játiva and Carl Epling 1058 (immature fruit; US, LA).

ECUADOR, PICHINCHA: Santo Domingo de los Colorados, alt. 620 m., wet tropical forest, Feb. 27, 1965, E. L. Little, Jr. 20450 (♀ buds, fruit; HOLOTYPE, US; isotype, NY); 20 km. W. of Santo Domingo de los Colorados, alt. 1000 ft., seasonal rain forest, Nov. 1, 1961, P. C. D. Cazalet and T. D. Pennington 5233 (US).

Clusia venusta is common in the wet tropical forest of Esmeraldas and Pichincha, south at least to Santo Domingo de los Colorados at 620 m. altitude.

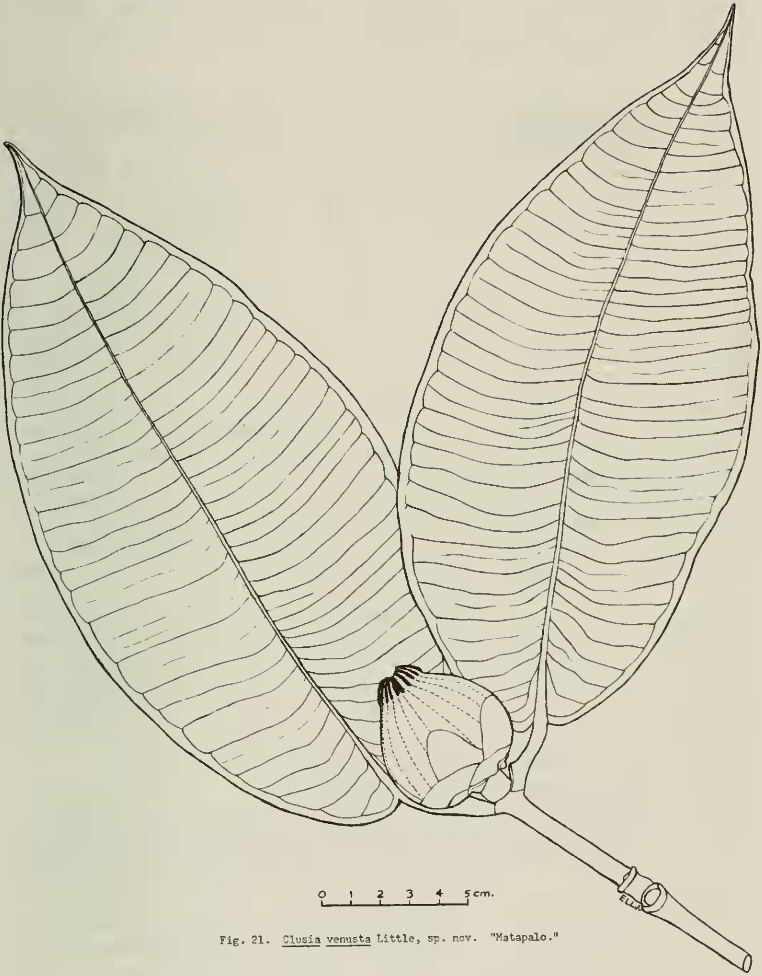

Fig. 21. Clusia venusta Little, sp. nov. "Matapalo."

Fig. 20 shows a leafy twig with large male flower bud (E. L. Little, Jr., and R. G. Dixon 21054). Fig. 21 illustrates a twig with mature capsule. Fig. 22, A, side view of immature female flower bud; B and C, end and side views of the same mature capsule with 21 carpels. Figs. 21 and 22 are from the type collection (E. L. Little, Jr. 20450). All drawings, also the descriptions, were made from fresh specimens.

This handsome epiphytic woody vine is easily recognized by its large showy solitary flowers, its distinctive leaves with prominent veins, and the large fruits with numerous carpels. The leaves are coriaceous, not succulent as in most species of the genus, and acuminate. Lateral nerves are conspicuous and unusual, about 25-35 on each side of costa departing nearly at right angle, slender, straight, and parallel, and connected near margin.

The number of carpels is very high, 17-21, as shown readily by the numbers of stigmas, lines on outside of fruit and segments of dehiscence, and cells or locules in ovary in capsule. In Clusia the characteristic number of carpels is 5-10, rarely 12 or more. Apparently, this species has the highest number yet recorded in this genus. However, 2 Ecuadoran species named from collections in the 1943 forest survey have numbers nearly as great, as indicated by their names. C. polystigma Little (Wash. Acad. Sci. Jour. 38: 104, fig. 15. 1948), a large woody vine collected at San Lorenzo, Esmeraldas, has 16-19 carpels. C. plurivalvis Little (Wash. Acad. Sci. Jour. 38: 102, fig. 17. 1948), an erect tree from Huigra, Province of Chimborazo, has 13-16 carpels.

Clusia L. has perhaps nearly 200 named species in tropical America. The genus is particularly well represented in the Andes of Colombia. Fifty species were described from that country in an article by José Cuatrecasas (Notas a la Flora de Colombia. X. Acad. Colomb. Cienc. Revista 8: 33-64, illus. 1950). Clusia dixonii Little (Phytologia 18: 468, fig. 15. 1969) was collected in the Andes of Ecuador near the border of Esmeraldas.

The relationships of Clusia venusta are uncertain. It resembles slightly C. crenata Cuatr. (Acad. Colomb. Cienc. Revista 8: 42, pl. 1. 1950) of Departamento del Valle, Cordillera Occidental of Colombia. That species is one of few in Colombia with coriaceous leaves and very impressed veins. It was referred by its author to Clusia sect. Phloianthera, though not typical. The last classification of subgeneric ranks in Clusia was by A. Engler (in A. Engler and K. Prantl, Natürl. Pflanzenfam. 2 Aufl. 21: 198-204, illus. 1925).

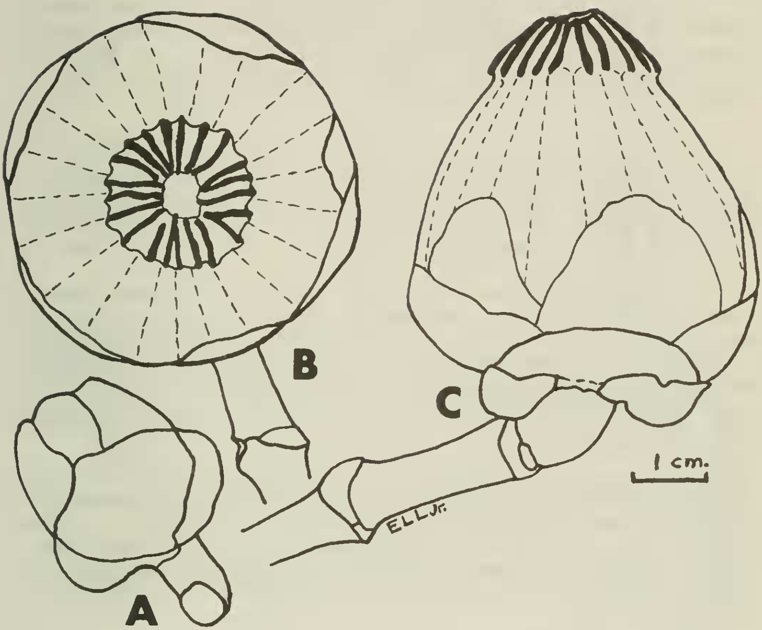

Fig. 22. Clusia venusta Little, sp. nov. "Matapalo." A, side view of immature female flower bud. B and C, end and side views of the same mature capsule with 21 carpels.

INGA SPECTABILIS (Vahl) Willd. var. **SCHIMPFII** (Harms) Little, comb. nov. "Guaba machetón," "guabo machete." Fig. 23.

Inga schimpfii Harms, Repert. Sp. Nov. Fedde 43: 112. 1938.

The type of Inga schimpfii Harms was collected west of Bucay, Province of Bolívar, Ecuador, alt. 300 m., on a tributary of Río Chimbo, Apr. 20, 1934 (H. J. F. Schimpff 1032; isotype seen at US). In the original description, Harms noted the close relationship with Inga spectabilis, which differed in having larger flowers and broader ovate floral bracts. However, the foliage and angled twigs were very related. (The giant legumes like machetes, lacking in the isotype, are similar too.)

In the 1943 forest survey I collected specimens at Pichilingue, Province of Los Ríos, alt. 45 m., noting that this was a common shade tree in cacao plantations (E. L. Little, Jr. 6495, May 22, 1943; US; Caribbean Forester 9: 240. 1948). The identification as Inga schimpfii was made by Ellsworth P. Killip.

The U. S. National Herbarium (US) has these additional specimens, all from Ecuador: Province of Chimborazo, Río Chanchan near Huigra, 4000-4500 ft., May 7-14, 1945, W. H. Camp E-3228; Galápagos Is., Santa Cruz Is., introduced, Ira L. Wiggins 18528 and Luis A. Fournier 261; Province of Esmeraldas, Businga on Río Verde, wet forest, alt. 300 m., Oct. 1, 1965, E. L. Little, Jr., and R. G. Dixon 21191.

Inga spectabilis (Vahl) Willd. (Sp. Pl. Ed. 4, 4: 1017. 1806) is recorded from Costa Rica, Panama, Colombia, and Venezuela, apparently also from Mexico, by Jorge León (Central American and West Indian species of Inga (Leguminosae). Mo. Bot. Gard. Ann. 53: 322-323. 1966). Reduction of I. schimpfii to synonymy has been suggested, but the relationship is that of a geographical variety.

Inga schimpfii is united here as a southern, small-flowered variety with narrow corolla less than 15 mm. long and smaller floral bracts, extending the range of I. spectabilis southward to western Ecuador. The typical variety has corollas 18-24 mm. long, according to León.

Fig. 23 shows a leaf and a legume from a wild tree in Esmeraldas (E. L. Little, Jr., and R. G. Dixon 21191) but lacks the flowers, which characterize the variety.

(To be continued.)

Forest Service, United States Department of Agriculture, Washington, D. C. 20250.

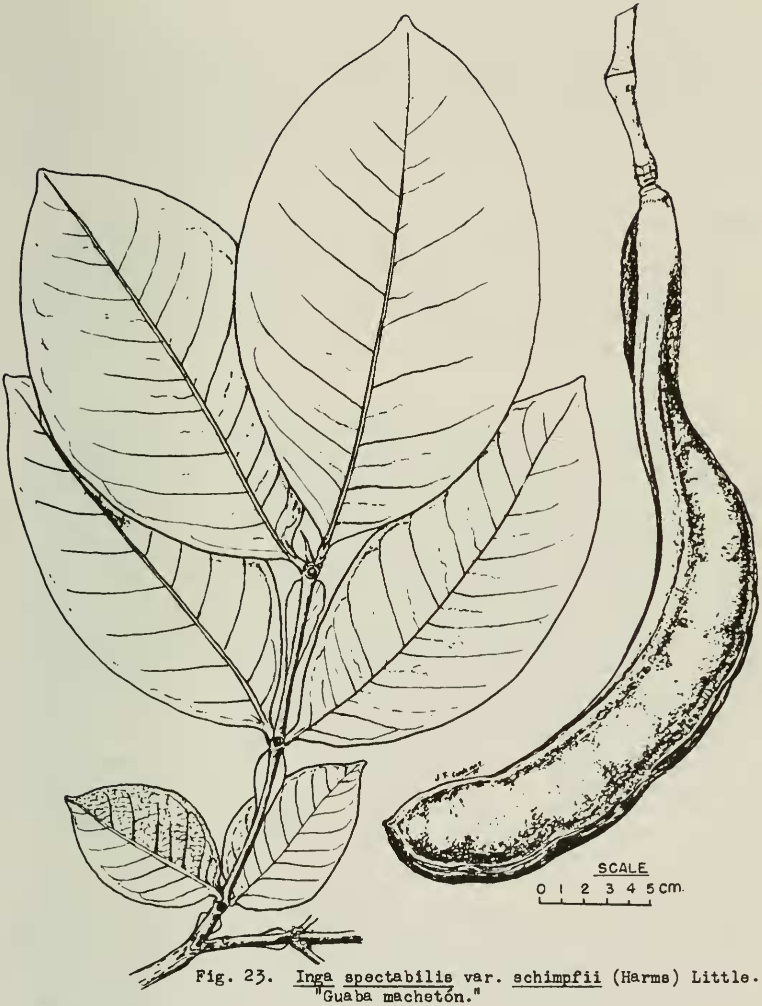

Fig. 23. Inga spectabilis var. schimpfii (Harms) Little.
"Guaba machetón."